HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 10010812-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Wenting Tang et al.

Confirmation No.: 5913

Application No.: 09/880,631

Examiner: G. G. Todd

Filing Date: June 12, 2001

Group Art Unit: 2157

Title: METHOD AND STYSTEM FOR MODULAR TRANSMISSION CONTROL PROTOCOL (TCP) RARE-HANDOFF DESIGN IN A STREAMS BASED TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP) IMPLEMENTATION

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 5, 2007.

The fee for filing this Appeal Brief was paid with the Appeal Brief previously filed on 9/19/2005

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

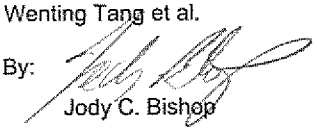
☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of 0. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

Respectfully submitted,

Wenting Tang et al.

By: 
Jody C. Bishop

Attorney/Agent for Applicant(s)

Reg No. : 44,034

Date : June 5, 2007

Telephone : 214-855-8007

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Docket No.: 10010812-1
(PATENT)

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Wenting Tang et al.

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For: METHOD AND SYSTEM FOR MODULAR TRANSMISSION CONTROL PROTOCOL (TCP) RARE-HANDOFF DESIGN IN A STREAMS BASED TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP)IMPLEMENTATION

Examiner: G. G. Todd

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on April 5, 2007, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) were dealt with in the Appeal Brief filed September 19, 2005. No further fees are believed to be due for this Appeal Brief.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

I. Real Party In Interest
II. Related Appeals and Interferences

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Hewlett-Packard Development Company, L.P., a Texas Limited Partnership having its principal place of business in Houston, Texas.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 37 claims pending in application.

B. Current Status of Claims

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-37
4. Claims allowed: None
5. Claims rejected: 1-37

C. Claims On Appeal

The claims on appeal are claims 1-37

IV. STATUS OF AMENDMENTS

A first Office Action was mailed for this application September 22, 2004. In response, Applicant filed an Amendment on December 22, 2004, which presented an amendment to claim 5. A Final Office Action was then mailed April 20, 2005. Applicant did not file an amendment in response to the Final Office Action, but instead filed a Notice of Appeal on July 19, 2005 and filed a supporting Appeal Brief on September 19, 2005. The rejection at issue in that appeal was that all of claims 1-37 stood rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,775,692 issued to Albert et al ("*Albert*").

In response to such Appeal Brief, the Examiner did not submit an Answer, but instead reopened prosecution and mailed an Office Action dated April 6, 2006 which raised a Restriction Requirement. Applicant traversed the Restriction Requirement in a response dated May 5, 2006, and the Restriction Requirement was withdrawn in an Office Action mailed July 27, 2006. However, the July 27, 2006 Office Action rejected the claims on new grounds, namely rejecting all of claims 1-37 under 35 U.S.C. § 103(a) as being unpatentable over *Albert* in view of U.S. Patent No. 5,774,660 issued to Brendel et al ("*Brendel*"). Applicant submitted a response on October 25, 2006 which did not amend any of the claims, but instead pointed out that *Brendel* does not correct the deficiencies of *Albert* that were noted in the previous Appeal.

A Final Office Action was then mailed January 12, 2007 that maintained the rejection of claims 1-37 under 35 U.S.C. § 103(a) as being unpatentable over *Albert* in view of *Brendel*. Applicant did not file an amendment in response to the Final Office Action, but instead filed a Notice of Appeal, which this brief supports. Thus, the claims on appeal are those claims rejected in the Final Office Action mailed January 12, 2007, and a listing of those claims are provided in Appendix A hereto.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the separately argued claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

According to one claimed embodiment of the present invention, a method of TCP state migration in a communication network comprises establishing a TCP/IP communication session between a client computer (e.g., client 410 of Figure 4) and a first server computer (e.g., server 450 of Figure 4). The first server computer is part of a plurality of server computers forming a web cluster containing information (e.g., web cluster 490 of Figure 4). The communication session is established for the transfer of data contained within the information. The method further comprises handing off the communication session to a selected server computer (e.g., server 452 of Figure 4, and see page 23, lines 9-13 of the specification) from the first server computer over a persistent control channel using TCP handoff modules (e.g., Upper TCP module 522 and Bottom TCP module 524 of Figure 5C, and *see* page 8, line 25 – page 11, line 6, and page 29, line 27 – page 30, line 6 of the specification) that are dynamically loadable (*see* page 17, line 24 – page 18, line 15 of the specification) within TCP/IP stacks in operating systems located at both the first server computer and the selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol (*see* page 23, line 21 – page 26, line 29 of the specification). The method further comprises migrating a first TCP state of the first server computer to the selected server computer, and a second TCP state of the selected server computer to the first server computer over the control channel (e.g., page 10, line 26 – page 11, line 28 of the specification).

In one embodiment, establishing the TCP/IP communication session further comprises receiving a SYN packet from the client at a first BTCP module located at the first server

computer (block 1010 of Figure 10); sending the SYN packet upstream to a first TCP module located above the first BTCP module in a first operating system of the first server computer (block 1020 of Figure 10); receiving a first SYN/ACK packet from the first TCP module (block 1030 of Figure 10); parsing the first initial TCP state from the first SYN/ACK packet, including a first initial sequence number for the first TCP module associated with the TCP/IP communication session (block 1040 of Figure 10); sending the SYN/ACK packet to the client (block 1050 of Figure 10); receiving an ACK packet from the client at the first BTCP module (block 1060 of Figure 10); sending the ACK packet to the first TCP module (block 1070 of Figure 10); receiving a web request packet associated with the TCP/IP communication session at the first BTCP module at the first server computer (block 1080 of Figure 10); and storing the SYN, ACK and the web request packet at the first server computer (block 1090 of Figure 10).

In one embodiment, handing off the communication session further comprises examining content of the web request packet; determining which of the plurality of server computers, a selected server computer, can best process the WEB request packet, based on the content (page 10, lines 7-16 of the specification); sending a handoff request from said first BTCP module to a second BTCP module at the selected server computer over the control channel, if the selected server computer is not the first server computer; including the SYN packet and the ACK packet in the handoff request packet; changing a first destination IP address of said SYN packet to a second IP address of said selected server computer, at said second BTCP module; sending said SYN packet to said second TCP module; receiving a second SYN/ACK packet at said second BTCP module; parsing said second initial TCP state from said second SYN/ACK packet, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session; changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module; updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session; sending said ACK packet that is updated to said second TCP module; and sending a handoff acknowledgment message to said first BTCP module.

According to another claimed embodiment, a method of TCP state migration in a communication network comprises establishing a TCP/IP communication session between a client computer (e.g., client 410 of Figure 4) and a first server computer (e.g., server 450 of Figure 4). The first server computer is part of a plurality of server computers forming a web cluster containing information (e.g., web cluster 490 of Figure 4), and the communication session is established for the transfer of data contained within the information. The method further comprises monitoring traffic associated with establishing said TCP/IP communication session to understand a first initial TCP state of the first server computer associated with the TCP/IP communication session, at a first bottom-TCP (BTCP) module at the first server computer (Bottom TCP module 524 of Figure 5 and BTCP module 830 of Figure 8, and *see* page 9, lines 16-20 and page 11, lines 8-11 of the specification). The method further comprises receiving a web request associated with the TCP/IP communication session at the first BTCP module at the first server computer (block 910 of Figure 9 and block 1310 of Figure 13, and *see* page 10, lines 7-8 of the specification). The method further comprises examining content of the web request, and determining which of the plurality of server computers ("a selected server computer") can best process the web request, based on the content (block 930 of Figure 9, and *see* page 10, lines 13-16 of the specification). The method further comprises handing off the communication session to the selected server (e.g., server 452 of Figure 4) computer from the first server computer over a persistent control channel, if the selected server computer is not the first server computer (*see* page 10, line 26 – page 11, line 28 and page 23, lines 9-13 of the specification). The method further comprises monitoring traffic associated with handing off the TCP/IP communication session to understand a second initial TCP state of the selected server computer associated with the TCP/IP communication session, at a second BTCP module at the selected server computer (e.g., BTCP module 870 of Figure 8, and *see* page 12, lines 1-13 of the specification). The method further comprises migrating the first initial TCP state to the selected server computer over the control channel, such that the second BTCP module can calculate a first TCP state for the first server computer in the TCP/IP communication session (e.g., page 12, line 15 – page 13, line 8 of the specification). The method further comprises sending a second initial TCP state of the selected server computer to the first BTCP module (e.g., BTCP module 830 of Figure 8), such that the first BTCP module can calculate a second TCP state for the selected

server computer in the TCP/IP communication session. The method further comprises forwarding data packets received at the first BTCP module from the client to the selected server computer, by changing the data packets to reflect the second TCP state and a second IP address of the selected server computer (e.g., block 1320 of Figure 13, and *see* page 12, line 15 – page 13, line 8 of the specification). The method further comprises sending response packets from the selected server computer directly to the client computer (*see* Figures 3 and 4) by changing the response packets to reflect the first TCP state and a first IP address of the first server computer (e.g., block 1440 of Figure 14, and *see* page 12, line 15- page 13, line 8 of the specification). And, the method further comprises terminating the TCP/IP communication session at the first server computer when the TCP/IP communication session is closed (e.g., page 13, lines 10-19).

According to another claimed embodiment, a server computer comprises an upper TCP (UTCP) module (e.g., UTCP module 522 of Figure 5C, and UTCP modules 810 and 850 of Figure 8) located above a TCP module (e.g., TCP module 520 of Figures 5B and 5C, and TCP modules 820 and 860 in Figure 8) in an operating system of the server computer. The server computer further comprises a bottom TCP (BTCP) module (e.g., BTCP module 524 of Figure 5C, and BTCP modules 830 and 870 of Figure 8) located below the TCP module. The UTCP, TCP, and BTCP modules implement a method of handing off a communication session between a first node (e.g., server 450 of Figure 4, and "front-end" node of Figure 8) and second node (e.g., server 452 of Figure 4, and "back-end" node of Figure 8) in a cluster network (e.g., cluster 490 of Figure 4) that works within the kernel level of an existing TCP/IP protocol, by migrating TCP states associated with the first and second nodes (*see* page 10, line 26 – page 12, line 13 of the specification).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,775,692 issued to Albert et al (hereinafter "*Albert*") in view of U.S. Patent No. 5,774,660 issued to Brendel et al. (hereinafter "*Brendel*").

VII. ARGUMENT

Appellant respectfully traverses the outstanding rejections of the pending claims, and requests that the Board reverse the outstanding rejections in light of the remarks contained herein. Below, Appellant argues many of the rejected claims separately. Thus, Appellant respectfully asserts that separately argued claims do not stand or fall together, *see* 37 C.F.R. § 41.37(c)(1)(vii).

All of claims 1-37 were previously rejected in a Final Office Action mailed April 20, 2005 as being anticipated under 35 U.S.C. § 102(e) by *Albert*. In response, Applicant appealed the rejection to the Board and submitted an Appeal Brief presenting arguments regarding why the claims are not anticipated by *Albert*. In response to the Appeal Brief, the Examiner has reopened prosecution and now rejects the claims as being unpatentable over *Albert* in view of *Brendel*.

Appellant respectfully submits that *Brendel* does not cure the deficiencies of *Albert* for the reasons discussed below. In particular, *Brendel* is discussed in the Background section of the present application (*see* page 5, line 25 – page 6, line 12 of the present application) and is noted as disclosing an inefficient mechanism for transferring TCP states that requires use of a proprietary protocol that is known only to the application level, which embodiments of the present invention overcome. Thus, for the reasons discussed further below, the combination of *Brendel* with *Albert* fails to render the claims unpatentable. As such, Appellant respectfully requests that the rejections be overturned and this application be passed to allowance.

The test for non-obvious subject matter is whether the differences between the subject matter and the prior art are such that the claimed subject matter as a whole would have been obvious to a person having ordinary skill in the art to which the subject matter pertains. The

United States Supreme Court in Graham v. John Deere and Co., 383 U.S. 1 (1966) set forth the factual inquiries which must be considered in applying the statutory test: (1) determining of the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; and (3) resolving the level of ordinary skill in the pertinent art. As discussed further hereafter, Applicant respectfully asserts that the claims include non-obvious differences over the cited art.

As discussed further below, when considering the scope and content of the applied *Albert* and *Brendel* references there are significant differences between the applied combination and the claims, as the applied combination fails to disclose all elements of the claims. Thus, considering the lack of disclosure in the applied combination of all elements of the claims, one of ordinary skill in the art would not find the claims obvious under 35 U.S.C. §103, and therefore the rejections should be overturned.

Independent Claim 1

Independent claim 1 recites:

> In a communication network, a method of TCP state migration comprising the steps of:
> a) establishing a TCP/IP communication session between a client computer and a first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;
> b) handing off said communication session to a selected server computer from said first server computer over a persistent control channel using TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol; and
> c) migrating a first TCP state of said first server computer to said selected server computer, and a second TCP state of said selected server computer to said first server computer over said control channel. (Emphasis added).

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 1. For the reasons discussed at length in the Appeal Brief of January 5, 2006,

Albert fails to disclose at least:

A) TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer;

B) handing off said communication session; and

C) a persistent control channel.

The Final Office Action appears to concede that *Albert* fails to teach or suggest "b) handing off said communication session to a selected server computer from said first server computer over a persistent control channel using TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol", *see* page 3 of the Final Office Action. However, the Final Office Action asserts that *Brendel* discloses this element of the claim. Appellant respectfully disagrees, as discussed below.

The present application briefly discusses *Brendel* at page 5, line 25 – page 6, line 12 as follows:

> Previously, various mechanisms for transferring TCP states were implemented, including using a separate proprietary protocol at the application layer of an operating system. For example, in the Brendel et al. patent (U.S. 5,774,660), incoming packets to the front-end node have their protocol changed from TCP/IP protocol to a non-TCP/IP standard that is only understood by the proprietary protocol located at the application layer. Later, the packets are changed back to the TCP/IP protocol for transmission to the back-end web server. Thus, the Brendel et al. patent reduces processing efficiency by switching back and forth between the user-level and kernel level layers of the operating system.
>
> Thus, a need exists for a more efficient design for implementing a mechanism for transferring TCP states in a web server cluster.

Thus, the present application expressly recognized that *Brendel* fails to provide TCP handoff modules within TCP/IP stacks in operating systems that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol. Instead, *Brendel*

requires that incoming packets be changed into a proprietary protocol that is understood only at the application layer. For instance, *Brendel* explains at col. 13, lines 40-46 thereof:

> Modified TCP/IP stack 82 contains the standard TCP and IP modules with some modifications explained later. One modification is that incoming packets from the Internet have their protocol changed from TCP to a proprietary "IXP" protocol. Since this IXP protocol is unknown to the standard TCP and IP layers, it is sent directly up to application layer 80 containing the load balancer.

Thus, *Brendel* appears to disclose a system in which the TCP/IP stack of an operating system is modified so as to change incoming packets from the TCP protocol to a proprietary protocol that is understood only at the application layer, rather than implementing TCP handoff modules within the TCP/IP stack to implement a TCP handoff protocol as recited by claim 1.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to disclose all elements of claim 1. As such, the rejection of claim 1 should be overturned, and claim 1 should be passed to allowance.

Independent Claim 11

Independent claim 11 recites:

In a communication network, a method of TCP state migration comprising the steps of:

a) establishing a TCP/IP communication session between a client computer and a first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;

b) monitoring traffic associated with establishing said TCP/IP communication session to understand a first initial TCP state of said first server computer associated with said TCP/IP communication session, at a first bottom-TCP (BTCP) module at said first server computer;

c) receiving a web request associated with said TCP/IP communication session at said first BTCP module at said first server computer;

d) examining content of said web request;

e) determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;

f) handing off said communication session to said selected server computer from said first server computer over a persistent control channel, if said selected server computer is not said first server computer;

g) monitoring traffic associated with handing off said TCP/IP communication session to understand a second initial TCP state of said selected server computer associated with said TCP/IP communication session, at a second BTCP module at said selected server computer;

h) migrating said first initial TCP state to said selected server computer over said control channel, such that said second BTCP module can calculate a first TCP state for said first server computer in said TCP/IP communication session;

i) sending a second initial TCP state of said selected server computer to said first BTCP module, such that said first BTCP module can calculate a second TCP state for said selected server computer in said TCP/IP communication session;

j) forwarding data packets received at said first BTCP module from said client to said selected server computer, by changing said data packets to reflect said second TCP state and a second IP address of said selected server computer;

k) sending response packets from said selected server computer directly to said client computer by changing said response packets to reflect said first TCP state and a first IP address of said first server computer; and

l) terminating said TCP/IP communication session at said first server computer when said TCP/IP communication session is closed.

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 11. As discussed further in the Appeal Brief of January 5, 2006, *Albert* fails to disclose at least:

A) a first bottom-TCP (BTCP) module at said first server computer, and a second BTCP module at said selected server computer;

B) examining content of said web request and determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;

C) sending response packets from said selected server computer directly to said client computer;

D) handing off said communication session; and

E) a persistent control channel.

Further, *Brendel* fails to teach or suggest at least a first bottom-TCP (BTCP) module at said first server computer, and a second BTCP module at said selected server computer, as recited by claim 11. For instance, as discussed above with claim 1, *Brendel* does not teach or suggest any such BTCP modules, but instead appears to disclose a modified TCP/IP stack that changes an incoming packet's protocol to a proprietary protocol that is unknown to the TCP/IP stack for handling at the application level.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to disclose all elements of claim 11. As such, the rejection of claim 11 should be overturned, and claim 11 should be passed to allowance.

Independent Claim 26

Independent claim 26 recites:

> A server computer comprising:
> an upper TCP (UTCP) module located above a TCP module in an operating system of said server computer;
> a bottom TCP (BTCP) module located below said TCP module, said UTCP, TCP, and BTCP modules implementing a method of handing off a communication session between a first node and second node in a cluster network that works within the kernel level of an existing TCP/IP protocol, by migrating TCP states associated with said first and second nodes.

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 26. As discussed further in the Appeal Brief of January 5, 2006, *Albert* fails to disclose the recited UTCP and BTCP modules.

Further, *Brendel* fails to disclose the UTCP and BTCP modules. For example, *Brendel* does not disclose UTCP, TCP, and BTCP modules that implement a method of handing off a communication session between a first node and second node in a cluster network that works within the kernel level of an existing TCP/IP protocol, as recited by claim 26. For instance, as discussed above with claim 1, *Brendel* does not disclose any such modules that implement handing off a communication session that works within the kernel level of an existing TCP/IP protocol, but instead appears to disclose a modified TCP/IP stack that changes an incoming packet's protocol to a proprietary protocol that is unknown to the TCP/IP stack for handling at the application level.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to disclose all elements of claim 26. As such, the rejection of claim 26 should be overturned, and claim 26 should be passed to allowance.

Dependent Claim 2

Claim 2 depends from claim 1 and thus inherits all elements of claim 1. Accordingly, claim 2 is allowable over the combination of *Albert* in view of *Brendel* at least for the reasons discussed above with claim 1. Additionally, claim 2 further recites:

> The method as described in Claim 1, wherein said step a) comprises the steps of:
> receiving a SYN packet from said client at a first BTCP module located at said first server computer;
> sending said SYN packet upstream to a first TCP module located above said first BTCP module in a first operating system of said first server computer;
> receiving a first SYN/ACK packet from said first TCP module;
> parsing said first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said first TCP module associated with said TCP/IP communication session;
> sending said SYN/ACK packet to said client;
> receiving an ACK packet from said client at said first BTCP module;
> sending said ACK packet to said first TCP module;
> receiving a web request packet associated with said TCP/IP communication session at said first BTCP module at said first server computer;
> storing said SYN, ACK and said web request packet at said first server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 2. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 2 (*see* pages 4-5 of the Final Office Action), as the reasoning for rejecting claim 2 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 2 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 2. For instance, *Albert* fails to disclose at least the recited first BTCP module located at said first server computer. Further, *Brendel* does not appear to be relied upon in the rejection of claim 2 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 2 be overturned.

Dependent Claim 3

Claim 3 depends from claim 2, which depends from claim 1, and thus claim 3 inherits all elements of claims 1 and 2. Accordingly, claim 3 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1 and 2. Additionally, claim 3 further recites:

> The method as described in Claim 2, wherein said step b) comprises the steps of:
>
> examining content of said web request packet;
>
> determining which of said plurality of server computers, a selected server computer, can best process said WEB request packet, based on said content;
>
> sending a handoff request from said first BTCP module to a second BTCP module at said selected server computer over said control channel, if said selected server computer is not said first server computer;
>
> including said SYN packet and said ACK packet in said handoff request packet;
>
> changing a first destination IP address of said SYN packet to a second IP address of said selected server computer, at said second BTCP module;
>
> sending said SYN packet to said second TCP module;
>
> receiving a second SYN/ACK packet at said second BTCP module;
>
> parsing said second initial TCP state from said second SYN/ACK packet, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session;
>
> changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module;
>
> updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;
>
> sending said ACK packet that is updated to said second TCP module; and
>
> sending a handoff acknowledgment message to said first BTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 3. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 3 (*see* pages 5-6 of the Final Office Action), as the reasoning for rejecting claim 3 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 3 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 3. For instance, *Albert* fails to teach at least the recited second BTCP module at said selected server computer. Further, as discussed below with independent claim 11, *Albert* fails to teach examining content of said web request packet and determining which of said plurality of server

computers, a selected server computer, can best process said WEB request packet, based on said content. Further, *Brendel* does not appear to be relied upon in the rejection of claim 3 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 3 be overturned.

Dependent Claim 4

Claim 4 depends from claim 3, which depends from claim 2 which depends from 1, and thus claim 4 inherits all elements of claims 1, 2, and 3. Accordingly, claim 4 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1-3. Additionally, claim 4 further recites:

> The method as described in Claim 3, wherein step c) comprises the steps of:
>
> monitoring traffic associated with establishing said TCP/IP communication session in step a), at said first BTCP module, to parse a first initial TCP state of said first server computer, said first initial TCP state associated with said TCP/IP communication session; and
>
> migrating said first initial TCP state to said second BTCP module over said control channel by including said first initial TCP state in said handoff request packet, said first initial TCP state including a first sequence number, such that said second BTCP module can calculate said first TCP state for said first server computer in said TCP/IP communication session.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 4. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 4 (*see* pages 6-7 of the Final Office Action), as the reasoning for rejecting claim 4 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 4 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 4. For instance, *Albert* fails to teach at least the recited "migrating said first initial TCP state to said second BTCP module over said control channel by including said first initial TCP state in said handoff request packet, said first initial TCP state including a first sequence number". Further, *Brendel* does not appear to be relied upon in the rejection of claim 4 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 4 be overturned.

Dependent Claim 5

Claim 5 depends from claim 3, which depends from claim 2 which depends from 1, and thus claim 5 inherits all elements of claims 1, 2, and 3. Accordingly, claim 5 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1-3. Additionally, claim 5 further recites:

> The method as described in Claim 3, wherein step c) comprises the steps of:
>
> monitoring traffic associated with handing off said TCP/IP communication session at said second BTCP module, to parse a second initial TCP state of said selected server computer, said second initial TCP state associated with said TCP/IP communication session; and
>
> migrating said second initial TCP state of said selected server computer to said first BTCP module by including said second initial TCP state in said handoff acknowledgment packet, said second initial TCP state including a second initial sequence number, such that said first BTCP module can calculate said second TCP state for said selected server computer in said TCP/IP communication session.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 5. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 5 (*see* page 7 of the Final Office Action), as the reasoning for rejecting claim 5 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 5 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 5. For instance, *Albert* fails to teach at least the recited "migrating said second initial TCP state of said selected server computer to said first BTCP module by including said second initial TCP state in said handoff acknowledgment packet, said second initial TCP state including a second initial sequence number". Further, *Brendel* does not appear to be relied upon in the rejection of claim 5 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 5 be overturned.

Dependent Claim 6

Claim 6 depends from claim 2, which depends from claim 1, and thus claim 6 inherits all elements of claims 1 and 2. Accordingly, claim 6 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1 and 2. Additionally, claim 6 further recites:

> The method as described in Claim 2, comprising the further steps of:
> intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said communication session; and
> holding said connection indication message at said first UTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 6. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 6 (*see* pages 7-8 of the Final Office Action), as the reasoning for rejecting claim 6 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 6 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 6. For instance, *Albert* fails to teach at least the recited first upper TCP UTCP) module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 6 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 6 be overturned.

Dependent Claim 7

Claim 7 depends from claim 6, which depends from claim 2 which depends from claim 1, and thus claim 7 inherits all elements of claims 1, 2, and 6. Accordingly, claim 7 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1, 2, and 6. Additionally, claim 7 further recites:

> The method as described in Claim 6, wherein said method comprises the further steps of:
> sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;
> discarding said connection indication message at said first UTCP module;
> receiving incoming data packets from said client at said first BTCP module;
> changing said destination addresses of said incoming data packets to said second IP address;
> updating sequence numbers and TCP checksum in said data packets to reflect said second TCP state of said selected server computer; and
> forwarding said data packets to said selected server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 7. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 7 (*see* pages 8-9 of the Final Office Action), as the reasoning for rejecting claim 7 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 7 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 7. For instance, *Albert* fails to teach at least the recited "sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module". Further, *Brendel* does not appear to be relied upon in the rejection of claim 7 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 7 be overturned.

Dependent Claim 8

Claim 8 depends from claim 6, which depends from claim 2 which depends from claim 1, and thus claim 8 inherits all elements of claims 1, 2, and 6. Accordingly, claim 8 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 1, 2, and 6. Additionally, claim 8 further recites:

> The method as described in Claim 6, comprising the further steps of:
> sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer;
> sending incoming data packets, including said web request packet, from said client, received at said first BTCP module, upstream.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 8. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 8 (*see* page 9 of the Final Office Action), as the reasoning for rejecting claim 8 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 8 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 8. For instance, *Albert* fails to teach at least the recited "sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer". Further, *Brendel* does not appear to be relied upon in the rejection of claim 8 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 8 be overturned.

Dependent Claim 9

Claim 9 depends from claim 1 and thus inherits all elements of claim 1. Accordingly, claim 9 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 1. Additionally, claim 9 further recites:

> The method as described in Claim 1, comprising the further step of:
> intercepting outgoing response packets from said selected server computer at a second bottom TCP (BTCP) module located at said selected server computer;
> changing source addresses of said response packets to a first IP address of said first server computer;
> updating sequence numbers and TCP checksum in said response packets to reflect said first TCP state of said first server computer; and
> sending said response packets to said client.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 9. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 9 (*see* pages 9-10 of the Final Office Action), as the reasoning for rejecting claim 9 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 9 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 9. For instance, *Albert* fails to teach at least the recited second bottom TCP (BTCP) module located at said selected server computer. Further, *Brendel* does not appear to be relied upon in the rejection of claim 9 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 9 be overturned.

Dependent Claim 10

Claim 10 depends from claim 1 and thus inherits all elements of claim 1. Accordingly, claim 10 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 1. Additionally, claim 10 further recites:

> The method as described in Claim 1, comprising the further steps of:
> monitoring TCP/IP control traffic for said communication session at said second BTCP module;
> understanding when said communication session is closed at said second server computer;
> sending a termination message to said first server computer over said control channel;
> terminating said TCP/IP communication session at said first server computer by terminating a forwarding mode at said first BTCP module; and
> freeing data resources associated with said communication session at said first server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 10. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 10 (*see* page 10 of the Final Office Action), as the reasoning for rejecting claim 10 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 10 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 10. For instance, *Albert* fails to teach at least the recited first and second bottom TCP (BTCP) modules. Further, *Brendel* does not appear to be relied upon in the rejection of claim 10 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 10 be overturned.

Dependent Claim 12

Claim 12 depends from claim 11 and thus inherits all elements of claim 11. Accordingly, claim 12 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. Additionally, claim 12 further recites:

> The method as described in Claim 11, wherein said step a) comprises the steps of:
> receiving a packet from said client at said first BTCP module;
> sending said SYN packet upstream to a first TCP module located above said first BTCP module in a first operating system of said first server computer;
> receiving a first SYN/ACK packet from said first TCP module;
> parsing said first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said first TCP module associated with, said TCP/IP communication session;
> sending said SYN/ACK packet to said client;
> receiving an ACK packet from said client at said first BTCP module;
> sending said ACK packet to said first TCP module;
> storing said SYN, ACK and said web request at said first server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 12. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 12, as the reasoning for rejecting claim 12 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 12 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 12. For instance, *Albert* fails to teach at least the recited "sending said SYN packet upstream to a first TCP module located above said first BTCP module in a first operating system of said first server computer". Further, *Brendel* does not appear to be relied upon in the rejection of claim 12 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 12 be overturned.

Dependent Claim 13

Claim 13 depends from claim 11 and thus inherits all elements of claim 11. Accordingly, claim 13 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. Additionally, claim 13 further recites:

> The method as described in Claim 11, wherein said step e) comprises the steps of:
> sending a handoff request packet from said first BTCP module to said second BTCP module over said control channel;
> including said SYN packet and said ACK packet in said handoff request packet;
> changing a first destination IP address of said SYN packet to a second IP address of said selected server computer, at said second BTCP module;
> sending said SYN packet to said second TCP module;
> receiving a second SYN/ACK packet at said second BTCP module;
> parsing said second initial TCP state from said second SYN/ACK packet, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session;
> changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module;
> updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;
> sending said ACK packet that is updated to said second TCP module; and
> sending a handoff acknowledgment message to said first BTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 13. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 13, as the reasoning for rejecting claim 13 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 13 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 13. For instance, *Albert* fails to teach at least the recited "changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module; ...and sending a handoff acknowledgment message to said first BTCP module" (emphasis added). Further, *Brendel* does not appear to be relied upon in the rejection of claim 13 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 13 be overturned.

Dependent Claims 14-15

Claims 14-15 each depend from claim 13, which depends from claim 11. Thus, claims 14 and 15 each inherit all elements of claims 11 and 13, and are therefore allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11 and 13. Therefore, Appellant respectfully requests that the rejection of claims 14 and 15 be overturned.

Dependent Claim 16

Claim 16 depends from claim 13, which depends from claim 11, and thus claim 16 inherits all elements of claims 11 and 13. Accordingly, claim 16 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11 and 13. Additionally, claim 16 further recites:

> The method as described in Claim 13, comprising the further steps of:
> intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said communication session; and
> holding said connection indication message at said first UTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 16. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 16, as the reasoning for rejecting claim 16 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 16 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 16. For instance, *Albert* fails to teach at least the recited first upper TCP (UTCP) module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 16 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 16 be overturned.

Dependent Claim 17

Claim 17 depends from claim 16, which depends from claim 13 which depends from claim 11, and thus claim 17 inherits all elements of claims 11, 13, and 16. Accordingly, claim 17 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11, 13, and 16. Additionally, claim 17 further recites:

> The method as described in Claim 16, wherein step h) comprises the further steps of:
> sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;
> discarding said connection indication message at said first UTCP module;
> receiving incoming data packets from said client at said first BTCP module;
> changing said destination addresses of said incoming data packets to said second IP address;
> updating sequence numbers and TCP checksum in said data packets to reflect said second TCP state of said selected server computer; and
> forwarding said data packets to said selected server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 17. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 17, as the reasoning for rejecting claim 17 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 17 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 17. For instance, *Albert* fails to teach at least the recited "sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module". Further, *Brendel* does not appear to be relied upon in the rejection of claim 17 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 17 be overturned.

Dependent Claim 18

Claim 18 depends from claim 11 and thus inherits all elements of claim 11. Accordingly, claim 18 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. Additionally, claim 18 further recites:

> The method as described in Claim 11, wherein step k) comprises the steps of:
> intercepting outgoing response packets from said selected server computer at said second BTCP module;
> changing source addresses of said response packets to said first IP address;
> updating sequence numbers and TCP checksum in said response packets to reflect said first TCP state of said first server computer; and
> sending said updated response packets to said client.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 18. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 18, as the reasoning for rejecting claim 18 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 18 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 18. For instance, *Albert* fails to teach at least the recited "intercepting outgoing response packets from said selected server computer at said second BTCP module". Further, *Brendel* does not appear to be relied upon in the rejection of claim 18 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 18 be overturned.

Dependent Claim 19

Claim 19 depends from claim 11 and thus inherits all elements of claim 11. Accordingly, claim 19 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. Additionally, claim 19 further recites:

> The method as described in Claim 11, wherein step 1) comprises the steps of:
> monitoring TCP/IP control traffic for said communication session at said second BTCP module;
> understanding when said communication session is closed at said second server computer;
> sending a termination message to said first server computer over said control channel;
> terminating a forwarding mode at said first BTCP module; and
> freeing data resources associated with said communication session at said first server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 19. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 19, as the reasoning for rejecting claim 19 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 19 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 19. For instance, *Albert* fails to teach at least the recited "monitoring TCP/IP control traffic for said communication session at said second BTCP module" and "terminating a forwarding mode at said first BTCP module". Further, *Brendel* does not appear to be relied upon in the rejection of claim 19 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 19 be overturned.

Dependent Claim 20

Claim 20 depends from claim 16, which depends from claim 13 which depends from claim 11, and thus claim 20 inherits all elements of claims 11, 13, and 16. Accordingly, claim 20 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11, 13, and 16. Additionally, claim 20 further recites:

> The method as described in Claim 16, comprising the further steps of:
> sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer; and
> sending incoming data packets, including said web request, from said client, received at said first BTCP module, upstream.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 20. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 20, as the reasoning for rejecting claim 20 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 20 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 20. For instance, *Albert* fails to teach at least the recited "sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer". Further, *Brendel* does not appear to be relied upon in the rejection of claim 20 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 20 be overturned.

Dependent Claim 21

Claim 21 depends from claim 11 and thus inherits all elements of claim 11. Accordingly, claim 21 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. Additionally, claim 21 further recites:

> The method as described in Claim 11, wherein each of said plurality of server computers is constructed similarly including BTCP modules located

> downstream from TCP modules, and UTCP modules located upstream from TCP modules.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 21. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 21, as the reasoning for rejecting claim 21 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 21 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 21. For instance, *Albert* fails to teach each of its server computers include BTCP modules located downstream from TCP modules, and UTCP modules located upstream from TCP modules. Again, *Albert* fails to teach the recited BTCP and UTCP modules. Further, *Brendel* does not appear to be relied upon in the rejection of claim 21 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 21 be overturned.

Dependent Claim 22

Claim 22 depends from claim 12, which depends from claim 11. Thus, claim 22 inherits all elements of claims 11 and 12, and are therefore allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11 and 12. Therefore, Appellant respectfully requests that the rejection of claim 22 be overturned.

Dependent Claim 23

Claim 23 depends from claim 22, which depends from claim 12 which depends from claim 11. Thus, claim 23 inherits all elements of claims 11, 12, and 22. Accordingly, claim 23 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 11, 12, and 22. Additionally, claim 23 further recites:

> The method as described in Claim 22, wherein said control channel allows for communication between all UTCP modules.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 23. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 23, as the reasoning for rejecting claim 23 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 23 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 23. For instance, *Albert* fails to teach each UTCP modules, and thus fails to teach a control channel that allows communication between all of such UTCP modules. Further, *Brendel* does not appear to be relied upon in the rejection of claim 23 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 23 be overturned.

Dependent Claims 24-25

Claims 24-25 each depend from claim 11, and thus claims 24 and 25 each inherit all elements of claim 11. Therefore, claims 24-25 are each allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 11. As such, Appellant respectfully requests that the rejection of claims 24 and 25 be overturned.

Dependent Claim 27

Claim 27 depends from claim 26 and thus inherits all elements of claim 26. Accordingly, claim 27 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 26. Additionally, claim 27 further recites:

> The server computer as described in Claim 26, wherein said method comprises the steps of:
>
> a) establishing a TCP/IP communication session between a client computer and said server computer, said first node, said server computer part of a plurality of server computers forming said cluster network containing information, said communication session established for the transfer of data contained within said information;
>
> b) receiving a web request associated with said TCP/IP communication session at a first BTCP module at said server computer;
>
> c) examining content of said web request;
>
> d) determining which of said plurality of server computers, a selected

server computer, can best process said web request, based on said content;

e) handing off said communication session to said selected server computer from said server computer over a persistent control channel, if said selected server computer is not said server computer; and

f) migrating a first TCP state of said server computer to said selected server computer, and sending a second TCP state of said selected server computer to said server computer over said control channel. (Emphasis added).

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 27. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 27, as the reasoning for rejecting claim 27 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 27 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 27. For instance, as discussed above with claim 11, *Albert* fails to teach determining which of the plurality of server computers, a selected server computer, can best process a web request, based on content of the web request. As also discussed above with claim 11, *Albert* fails to teach handing of a communication session over a persistent control channel. Further, *Brendel* does not appear to be relied upon in the rejection of claim 27 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 27 be overturned.

Dependent Claim 28

Claim 28 depends from claim 27, which depends from claim 26, and thus claim 28 inherits all elements of claims 26 and 27. Accordingly, claim 28 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26 and 27. Additionally, claim 28 further recites:

The server computer as described in Claim 27, wherein step a) of said method comprises the steps of:

receiving a SYN packet from said client at said BTCP module;

sending said SYN packet upstream to said TCP module;

receiving a first SYN/ACK packet from said TCP module;

parsing a first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said TCP module associated with said TCP/IP communication session;

sending said SYN/ACK packet to said client;
receiving an ACK packet from said client at said BTCP module;
sending said ACK packet to said TCP module;
storing said SYN, ACK at said server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 28. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 28, as the reasoning for rejecting claim 28 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 28 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 28. For instance, as discussed above, *Albert* fails to teach the BTCP module, and thus for at least this reason *Albert* fails to teach the above steps that involve such BTCP module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 28 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 28 be overturned.

Dependent Claim 29

Claim 29 depends from claim 28, which depends from claim 27 which depends from claim 26, and thus claim 29 inherits all elements of claims 26-28. Accordingly, claim 29 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26-28. Additionally, claim 29 further recites:

The server computer as described in Claim 28, wherein said method comprises the steps of:
sending a handoff request packet from said BTCP module to a second BTCP module over said control channel, said second BTCP module located below a second TCP module in a second operating system at said selected server computer;
including said SYN packet and said ACK packet in said handoff request;
receiving a handoff acknowledgment message at said BTCP module from said second BTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 29. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 29, as the reasoning for rejecting claim 29 appears to be the same as in the Final Office

Action of April 20, 2005 (in which claim 29 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 29. For instance, as discussed above, *Albert* fails to teach the recited BTCP modules, and thus for at least this reason *Albert* fails to teach the above steps that involve such BTCP modules. Further, *Brendel* does not appear to be relied upon in the rejection of claim 29 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 29 be overturned.

Dependent Claim 30

Claim 30 depends from claim 29, which depends from claim 28 which depends from claim 27 which depends from claim 26, and thus claim 30 inherits all elements of claims 26-29. Accordingly, claim 30 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26-29. Additionally, claim 30 further recites:

> The server computer as described in Claim 29, wherein said step f) of said method comprises the steps of:
>
> monitoring traffic associated with establishing said TCP/IP communication session in step a), at said BTCP module, to parse a first initial TCP state of said server computer, said first initial TCP state associated with said TCP/IP communication session; and
>
> migrating said first initial TCP state to said second BTCP module over said control channel by including said first initial TCP state in said handoff request, said first initial TCP state including a first sequence number, such that said second BTCP module can calculate said first TCP state for said server computer in said TCP/IP communication session.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 30. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 30, as the reasoning for rejecting claim 30 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 30 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 30. For instance, as discussed above, *Albert* fails to teach the recited BTCP module and control channel, and thus for at least these reasons *Albert* fails to teach the above steps that involve such BTCP modules and control

channel. Further, *Brendel* does not appear to be relied upon in the rejection of claim 30 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 30 be overturned.

Dependent Claim 31

Claim 31 depends from claim 29, which depends from claim 28 which depends from claim 27 which depends from claim 26, and thus claim 31 inherits all elements of claims 26-29. Accordingly, claim 31 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26-29. Additionally, claim 31 further recites:

> The server computer as described in Claim 29, wherein said method comprises the further steps of:
>
> intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said communication session; and
>
> holding said connection indication message at said first UTCP module.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 31. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 31, as the reasoning for rejecting claim 31 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 31 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 31. For instance, *Albert* fails to teach the recited first upper TCP (UTCP) module, and thus for at least this reason *Albert* fails to teach the above steps that involve such UTCP module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 31 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 31 be overturned.

Dependent Claim 32

Claim 32 depends from claim 31, which depends from claim 29 which depends from claim 28 which depends from claim 27 which depends from claim 26, and thus claim 32 inherits all elements of claims 26-29 and 31. Accordingly, claim 32 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26-29 and 31. Additionally, claim 32 further recites:

> The computer system as described in Claim 31, wherein said method comprises the further steps of:
> sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;
> discarding said connection indication message at said first UTCP module;
> receiving incoming data packets from said client at said first BTCP module;
> changing said destination addresses of said incoming data packets to said second IP address;
> updating sequence numbers and TCP checksum in said data packets to reflect said second TCP state of said selected server computer; and
> forwarding said data packets to said selected server computer.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 32. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 32, as the reasoning for rejecting claim 32 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 32 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 32. For instance, *Albert* fails to teach the recited "sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module" and "discarding said connection indication message at said first UTCP module". Further, *Brendel* does not appear to be relied upon in the rejection of claim 32 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 32 be overturned.

Dependent Claim 33

Claim 33 depends from claim 31, which depends from claim 29 which depends from claim 28 which depends from claim 27 which depends from claim 26, and thus claim 33 inherits all elements of claims 26-29 and 31. Accordingly, claim 33 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26-29 and 31. Additionally, claim 33 further recites:

> The server computer as described in Claim 31, said method comprising the further steps of:
>
> sending notification from said BTCP module to said UTCP module to release said connection indication message, if said selected server computer is said server computer;
>
> sending incoming data packets, including said web request, from said client, received at said first BTCP module, upstream.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 33. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 33, as the reasoning for rejecting claim 33 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 33 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 33. For instance, *Albert* fails to teach the recited BTCP and UTCP modules, and thus for at least this reason *Albert* fails to teach the above steps involving such modules. Further, *Brendel* does not appear to be relied upon in the rejection of claim 33 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 33 be overturned.

Dependent Claim 34

Claim 34 depends from claim 26, and thus inherits all elements of claim 26. Accordingly, claim 34 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claim 26. Additionally, claim 34 further recites:

> The server computer as described in Claim 26, said method comprising the further steps of:
> receiving a handoff request from a first BTCP module located at a first server computer within said cluster network over a persistent control channel, said first server computer having established a communication session with a client computer, said communication session established for the transfer of data contained within said server computer, said handoff request including a SYN packet and an ACK packet, said SYN and ACK packet used for establishing said communication session between said client and said first server computer, said ACK packet including a first initial TCP state of said first server computer in said communication session, including a first initial TCP sequence number;
> changing a first destination IP address of said SYN packet to a second IP address of said server computer, at said BTCP module;
> sending said SYN packet to said TCP module;
> receiving a SYN/ACK packet at said second BTCP module;
> parsing a second initial TCP state from second SYN/ACK packet, including a second initial sequence number, for said TCP module, said second initial TCP state associated with a second TCP state for said server computer in said TCP/IP communication session;
> changing a second destination IP address of said ACK packet to said second IP address, at said BTCP module;
> updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;
> sending said ACK packet that is updated to said TCP module; and
> sending a handoff acknowledgment message to said first BTCP module over said control channel.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 34. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 34, as the reasoning for rejecting claim 34 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 34 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 34. For instance, *Albert* fails to teach at least the recited "receiving a handoff request from a first BTCP module located at a first server

computer within said cluster network over a persistent control channel". As discussed above with claim 11, *Albert* fails to teach a first BTCP module or a persistent control channel. Further, *Albert* fails to teach a "handoff request". Rather, *Albert* merely teaches that its forwarding agents forward packets to a selected back-end server, rather than handing off the TCP communication session. Further, *Brendel* does not appear to be relied upon in the rejection of claim 34 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 34 be overturned.

Dependent Claim 35

Claim 35 depends from claim 34, which depends from claim 26, and thus claim 35 inherits all elements of claims 26 and 34. Accordingly, claim 35 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26 and 34. Additionally, claim 35 further recites:

> The server computer as described in Claim 34, wherein said method comprises the further steps of:
>
> monitoring traffic associated with handing off said TCP/IP communication session to said server computer, at said BTCP module, to parse said second initial TCP state of said server computer, said second initial TCP state associated with said TCP/IP communication session; and
>
> sending said second initial TCP state of said server computer to said first BTCP module by including said second initial TCP state in said handoff acknowledgment, said second initial TCP state including a second initial sequence number, such that said first BTCP module can calculate said second TCP state for said server computer in said TCP/IP communication session.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 35. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 35, as the reasoning for rejecting claim 35 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 35 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 35. For instance, *Albert* fails to teach at least the recited BTCP module, thus for at least this reason *Albert* fails to teach the above steps

that involve such BTCP module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 35 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 35 be overturned.

Dependent Claim 36

Claim 36 depends from claim 34, which depends from claim 26, and thus claim 36 inherits all elements of claims 26 and 34. Accordingly, claim 36 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26 and 34. Additionally, claim 36 further recites:

> The server computer as described in Claim 34, wherein said method comprises the further steps of:
> intercepting outgoing response packets from said server computer at said second BTCP module;
> changing source addresses of said response packets to said first IP address;
> updating sequence numbers and TCP checksum in said response packets to reflect said first TCP state of said first server computer; and
> sending said response packets to said client.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 36. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 36, as the reasoning for rejecting claim 36 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 36 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 36. For instance, *Albert* fails to teach at least the recited second BTCP module, thus for at least this reason *Albert* fails to teach the above intercepting step that involves such second BTCP module. Further, *Brendel* does not appear to be relied upon in the rejection of claim 36 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 36 be overturned.

Dependent Claim 37

Claim 37 depends from claim 34, which depends from claim 26, and thus claim 37 inherits all elements of claims 26 and 34. Accordingly, claim 37 is allowable over *Albert* in view of *Brendel* at least for the reasons discussed above with claims 26 and 34. Additionally, claim 37 further recites:

> The server computer as described in Claim 34, wherein said method comprises the further steps of:
> monitoring TCP/IP control traffic for said communication session at said BTCP module;
> understanding when said communication session is closed at said server computer; and
> sending a termination message to said first server computer over said control channel.

The combination of *Albert* in view of *Brendel* fails to disclose all of the further elements of claim 37. The Final Office Action appears to rely upon *Albert* as disclosing all elements of claim 37, as the reasoning for rejecting claim 37 appears to be the same as in the Final Office Action of April 20, 2005 (in which claim 37 was rejected as being anticipated by *Albert*). However, *Albert* fails to disclose all elements of claim 37. For instance, *Albert* fails to teach at least the recited BTCP module and control channel, and thus fails to teach the above steps that involve such BTCP module and control channel. Further, *Brendel* does not appear to be relied upon in the rejection of claim 37 as disclosing these elements, nor does it do so.

Accordingly, Appellant respectfully requests that the rejection of claim 37 be overturned.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-2025, under Order No. 10010812-1 from which the undersigned is authorized to draw.

Respectfully submitted,

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4).

Dated: June 5, 2007

Signature: Donna Forbit
(Donna Forbit)

By _____
Jody C. Bishop
Attorney/Agent for Applicant(s)
Reg. No.: 44,034
Date: June 5, 2007
Telephone No. (214) 855-8007

APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/880,631

1. In a communication network, a method of TCP state migration comprising the steps of:

a) establishing a TCP/IP communication session between a client computer and a first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;

b) handing off said communication session to a selected server computer from said first server computer over a persistent control channel using TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol; and

c) migrating a first TCP state of said first server computer to said selected server computer, and a second TCP state of said selected server computer to said first server computer over said control channel.

2. The method as described in Claim 1, wherein said step a) comprises the steps of:

receiving a SYN packet from said client at a first BTCP module located at said first server computer;

sending said SYN packet upstream to a first TCP module located above said first BTCP module in a first operating system of said first server computer;

receiving a first SYN/ACK packet from said first TCP module;

parsing said first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said first TCP module associated with said TCP/IP communication session;

sending said SYN/ACK packet to said client;

receiving an ACK packet from said client at said first BTCP module;

sending said ACK packet to said first TCP module;

receiving a web request packet associated with said TCP/IP communication session at said first BTCP module at said first server computer;

storing said SYN, ACK and said web request packet at said first server computer.

3. The method as described in Claim 2, wherein said step b) comprises the steps of:

examining content of said web request packet;

determining which of said plurality of server computers, a selected server computer, can best process said WEB request packet, based on said content;

sending a handoff request from said first BTCP module to a second BTCP module at said selected server computer over said control channel, if said selected server computer is not said first server computer;

including said SYN packet and said ACK packet in said handoff request packet;

changing a first destination IP address of said SYN packet to a second IP address of said selected server computer, at said second BTCP module;

sending said SYN packet to said second TCP module;

receiving a second SYN/ACK packet at said second BTCP module;

parsing said second initial TCP state from said second SYN/ACK packet, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session;

changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module;

updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;

sending said ACK packet that is updated to said second TCP module; and

sending a handoff acknowledgment message to said first BTCP module.

4. The method as described in Claim 3, wherein step c) comprises the steps of:

monitoring traffic associated with establishing said TCP/IP communication session in step a), at said first BTCP module, to parse a first initial TCP state of said first server computer, said first initial TCP state associated with said TCP/IP communication session; and

migrating said first initial TCP state to said second BTCP module over said control

channel by including said first initial TCP state in said handoff request packet, said first initial TCP state including a first sequence number, such that said second BTCP module can calculate said first TCP state for said first server computer in said TCP/IP communication session.

5. The method as described in Claim 3, wherein step c) comprises the steps of:

monitoring traffic associated with handing off said TCP/IP communication session at said second BTCP module, to parse a second initial TCP state of said selected server computer, said second initial TCP state associated with said TCP/IP communication session; and

migrating said second initial TCP state of said selected server computer to said first BTCP module by including said second initial TCP state in said handoff acknowledgment packet, said second initial TCP state including a second initial sequence number, such that said first BTCP module can calculate said second TCP state for said selected server computer in said TCP/IP communication session.

6. The method as described in Claim 2, comprising the further steps of:

intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said communication session; and

holding said connection indication message at said first UTCP module.

7. The method as described in Claim 6, wherein said method comprises the further steps of:

sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;

discarding said connection indication message at said first UTCP module;

receiving incoming data packets from said client at said first BTCP module;

changing said destination addresses of said incoming data packets to said second IP address;

updating sequence numbers and TCP checksum in said data packets to reflect said second

TCP state of said selected server computer; and

forwarding said data packets to said selected server computer.

8. The method as described in Claim 6, comprising the further steps of:

sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer;

sending incoming data packets, including said web request packet, from said client, received at said first BTCP module, upstream.

9. The method as described in Claim 1, comprising the further step of:

intercepting outgoing response packets from said selected server computer at a second bottom TCP (BTCP) module located at said selected server computer;

changing source addresses of said response packets to a first IP address of said first server computer;

updating sequence numbers and TCP checksum in said response packets to reflect said first TCP state of said first server computer; and

sending said response packets to said client.

10. The method as described in Claim 1, comprising the further steps of:

monitoring TCP/IP control traffic for said communication session at said second BTCP module;

understanding when said communication session is closed at said second server computer;

sending a termination message to said first server computer over said control channel;

terminating said TCP/IP communication session at said first server computer by terminating a forwarding mode at said first BTCP module; and

freeing data resources associated with said communication session at said first server computer.

11. In a communication network, a method of TCP state migration comprising the steps of:

a) establishing a TCP/IP communication session between a client computer and a

first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;

b) monitoring traffic associated with establishing said TCP/IP communication session to understand a first initial TCP state of said first server computer associated with said TCP/IP communication session, at a first bottom-TCP (BTCP) module at said first server computer;

c) receiving a web request associated with said TCP/IP communication session at said first BTCP module at said first server computer;

d) examining content of said web request;

e) determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;

f) handing off said communication session to said selected server computer from said first server computer over a persistent control channel, if said selected server computer is not said first server computer;

g) monitoring traffic associated with handing off said TCP/IP communication session to understand a second initial TCP state of said selected server computer associated with said TCP/IP communication session, at a second BTCP module at said selected server computer;

h) migrating said first initial TCP state to said selected server computer over said control channel, such that said second BTCP module can calculate a first TCP state for said first server computer in said TCP/IP communication session;

i) sending a second initial TCP state of said selected server computer to said first BTCP module, such that said first BTCP module can calculate a second TCP state for said selected server computer in said TCP/IP communication session;

j) forwarding data packets received at said first BTCP module from said client to said selected server computer, by changing said data packets to reflect said second TCP state and a second IP address of said selected server computer;

k) sending response packets from said selected server computer directly to said client computer by changing said response packets to reflect said first TCP state and a first IP address of said first server computer; and

l) terminating said TCP/IP communication session at said first server computer when said TCP/IP communication session is closed.

12. The method as described in Claim 11, wherein said step a) comprises the steps of:

receiving a packet from said client at said first BTCP module;

sending said SYN packet upstream to a first TCP module located above said first BTCP module in a first operating system of said first server computer;

receiving a first SYN/ACK packet from said first TCP module;

parsing said first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said first TCP module associated with, said TCP/IP communication session;

sending said SYN/ACK packet to said client;

receiving an ACK packet from said client at said first BTCP module;

sending said ACK packet to said first TCP module;

storing said SYN, ACK and said web request at said first server computer.

13. The method as described in Claim 11, wherein said step e) comprises the steps of:

sending a handoff request packet from said first BTCP module to said second BTCP module over said control channel;

including said SYN packet and said ACK packet in said handoff request packet;

changing a first destination IP address of said SYN packet to a second IP address of said selected server computer, at said second BTCP module;

sending said SYN packet to said second TCP module;

receiving a second SYN/ACK packet at said second BTCP module;

parsing said second initial TCP state from said second SYN/ACK packet, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session;

changing a second destination IP address of said ACK packet to said second IP address, at said second BTCP module;

updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;

sending said ACK packet that is updated to said second TCP module; and

sending a handoff acknowledgment message to said first BTCP module.

14. The method as described in Claim 13, wherein said ACK packet includes said first initial TCP state of said first server computer as provided for in step f).

15. The method as described in Claim 13, wherein said handoff acknowledgment includes said second initial TCP state of said second server computer, including a second initial sequence number, for said second TCP module, that is associated with said TCP/IP communication session as provided for in step i).

16. The method as described in Claim 13, comprising the further steps of:

intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said communication session; and

holding said connection indication message at said first UTCP module.

17. The method as described in Claim 16, wherein step h) comprises the further steps of:

sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;

discarding said connection indication message at said first UTCP module;

receiving incoming data packets from said client at said first BTCP module;

changing said destination addresses of said incoming data packets to said second IP address;

updating sequence numbers and TCP checksum in said data packets to reflect said second TCP state of said selected server computer; and

forwarding said data packets to said selected server computer.

18. The method as described in Claim 11, wherein step k) comprises the steps of:

intercepting outgoing response packets from said selected server computer at said second BTCP module;

changing source addresses of said response packets to said first IP address;

updating sequence numbers and TCP checksum in said response packets to reflect said

first TCP state of said first server computer; and

sending said updated response packets to said client.

19. The method as described in Claim 11, wherein step 1) comprises the steps of:

monitoring TCP/IP control traffic for said communication session at said second BTCP module;

understanding when said communication session is closed at said second server computer;

sending a termination message to said first server computer over said control channel;

terminating a forwarding mode at said first BTCP module; and

freeing data resources associated with said communication session at said first server computer.

20. The method as described in Claim 16, comprising the further steps of:

sending notification from said first BTCP module to said first UTCP module to release said connection indication message, if said selected server computer is said first server computer; and

sending incoming data packets, including said web request, from said client, received at said first BTCP module, upstream.

21. The method as described in Claim 11, wherein each of said plurality of server computers is constructed similarly including BTCP modules located downstream from TCP modules, and UTCP modules located upstream from TCP modules.

22. The method as described in Claim 12, comprising the further step of storing said web request, said SYN packet, said ACK packet, and said web request at said first server computer.

23. The method as described in Claim 22, wherein said control channel allows for communication between all UTCP modules.

24. The method as described in Claim 11, wherein said plurality of server computers is coupled together over a wide area network in said communication network.

25. The method as described in Claim 11, wherein said information is partitioned/partially replicated throughout each of said plurality of server computers.

26. A server computer comprising:

an upper TCP (UTCP) module located above a TCP module in an operating system of said server computer;

a bottom TCP (BTCP) module located below said TCP module, said UTCP, TCP, and BTCP modules implementing a method of handing off a communication session between a first node and second node in a cluster network that works within the kernel level of an existing TCP/IP protocol, by migrating TCP states associated with said first and second nodes.

27. The server computer as described in Claim 26, wherein said method comprises the steps of:

a) establishing a TCP/IP communication session between a client computer and said server computer, said first node, said server computer part of a plurality of server computers forming said cluster network containing information, said communication session established for the transfer of data contained within said information;

b) receiving a web request associated with said TCP/IP communication session at a first BTCP module at said server computer;

c) examining content of said web request;

d) determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;

e) handing off said communication session to said selected server computer from said server computer over a persistent control channel, if said selected server computer is not said server computer; and

f) migrating a first TCP state of said server computer to said selected server computer, and sending a second TCP state of said selected server computer to said server computer over said control channel.

28. The server computer as described in Claim 27, wherein step a) of said method comprises the steps of:

receiving a SYN packet from said client at said BTCP module;

sending said SYN packet upstream to said TCP module;

receiving a first SYN/ACK packet from said TCP module;

parsing a first initial TCP state from said first SYN/ACK packet, including a first initial sequence number for said TCP module associated with said TCP/IP communication session;

sending said SYN/ACK packet to said client;

receiving an ACK packet from said client at said BTCP module;

sending said ACK packet to said TCP module;

storing said SYN, ACK at said server computer.

29. The server computer as described in Claim 28, wherein said method comprises the steps of:

sending a handoff request packet from said BTCP module to a second BTCP module over said control channel, said second BTCP module located below a second TCP module in a second operating system at said selected server computer;

including said SYN packet and said ACK packet in said handoff request;

receiving a handoff acknowledgment message at said BTCP module from said second BTCP module.

30. The server computer as described in Claim 29, wherein said step f) of said method comprises the steps of:

monitoring traffic associated with establishing said TCP/IP communication session in step a), at said BTCP module, to parse a first initial TCP state of said server computer, said first initial TCP state associated with said TCP/IP communication session; and

migrating said first initial TCP state to said second BTCP module over said control channel by including said first initial TCP state in said handoff request, said first initial TCP state including a first sequence number, such that said second BTCP module can calculate said first TCP state for said server computer in said TCP/IP communication session.

31. The server computer as described in Claim 29, wherein said method comprises the further steps of:

intercepting a connection indication message sent from said first TCP module to an application layer above said first TCP module at a first upper-TCP (UTCP) module, said connection indication message sent by said first TCP module upon establishing said

communication session; and

holding said connection indication message at said first UTCP module.

32. The computer system as described in Claim 31, wherein said method comprises the further steps of:

sending a reset packet from said first BTCP module upon receiving said handoff acknowledgment packet to said first TCP module;

discarding said connection indication message at said first UTCP module;

receiving incoming data packets from said client at said first BTCP module;

changing said destination addresses of said incoming data packets to said second IP address;

updating sequence numbers and TCP checksum in said data packets to reflect said second TCP state of said selected server computer; and

forwarding said data packets to said selected server computer.

33. The server computer as described in Claim 31, said method comprising the further steps of:

sending notification from said BTCP module to said UTCP module to release said connection indication message, if said selected server computer is said server computer;

sending incoming data packets, including said web request, from said client, received at said first BTCP module, upstream.

34. The server computer as described in Claim 26, said method comprising the further steps of:

receiving a handoff request from a first BTCP module located at a first server computer within said cluster network over a persistent control channel, said first server computer having established a communication session with a client computer, said communication session established for the transfer of data contained within said server computer, said handoff request including a SYN packet and an ACK packet, said SYN and ACK packet used for establishing said communication session between said client and said first server computer, said ACK packet including a first initial TCP state of said first server computer in said communication session,

including a first initial TCP sequence number;

changing a first destination IP address of said SYN packet to a second IP address of said server computer, at said BTCP module;

sending said SYN packet to said TCP module;

receiving a SYN/ACK packet at said second BTCP module;

parsing a second initial TCP state from second SYN/ACK packet, including a second initial sequence number, for said TCP module, said second initial TCP state associated with a second TCP state for said server computer in said TCP/IP communication session;

changing a second destination IP address of said ACK packet to said second IP address, at said BTCP module;

updating said ACK packet to reflect said second TCP state of said selected server computer in said communication session;

sending said ACK packet that is updated to said TCP module; and

sending a handoff acknowledgment message to said first BTCP module over said control channel.

35. The server computer as described in Claim 34, wherein said method comprises the further steps of:

monitoring traffic associated with handing off said TCP/IP communication session to said server computer, at said BTCP module, to parse said second initial TCP state of said server computer, said second initial TCP state associated with said TCP/IP communication session; and

sending said second initial TCP state of said server computer to said first BTCP module by including said second initial TCP state in said handoff acknowledgment, said second initial TCP state including a second initial sequence number, such that said first BTCP module can calculate said second TCP state for said server computer in said TCP/IP communication session.

36. The server computer as described in Claim 34, wherein said method comprises the further steps of:

intercepting outgoing response packets from said server computer at said second BTCP module;

changing source addresses of said response packets to said first IP address;

updating sequence numbers and TCP checksum in said response packets to reflect said first TCP state of said first server computer; and

sending said response packets to said client.

37. The server computer as described in Claim 34, wherein said method comprises the further steps of:

monitoring TCP/IP control traffic for said communication session at said BTCP module;

understanding when said communication session is closed at said server computer; and

sending a termination message to said first server computer over said control channel.

APPENDIX B

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.